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(54) Title: METHOD OF PLAYING A CARD GAME

(57) Abstract

A method of playing a card game in which desired cards are selected by players. Cards (93) are first read and stored. Players select cards and then cards corresponding to the selected cards are delivered to each player. Selecting and delivering of cards is repeated until each player has a predetermined number of cards. The outcome of the game is then determined. Each card is marked with machine readable indicia so that players may receive cards corresponding to their selection. Null cards having no value in determining the outcome may be used and are delivered when players select the same card, select a card previously dealt or delivered, or do not select within a time limit. Poker rules may be used to determine the outcome.

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Description

Method of Playing a Card Game

Technical Field

The present invention relates to card games.

Background Art

Card games generally rely on a combination of skill and chance for their popularity. The most popular games, such as bridge, poker, rummy, and pinochle, all require a certain amount of skill to win, whereas those games which require less skill and more luck have either been forgotten, relegated to children or survive with some degree of popularity only in gambling houses.

The game of poker is well known and the rules can be found in nearly every card game rule book. In the game of poker cards are dealt to each player. Players may have a chance to improve their hand by discarding some of their cards, and receiving replacements, as in draw poker, or more cards may be dealt than needed and the best cards retained, as in the seven-card variations of poker. Various rounds of betting take place after dealing and after drawing. In stud poker, one card is dealt face down and the four remaining cards are dealt face up one at a time with a round of betting after each face up card is dealt. In all variations of poker, when the betting rounds are completed, the remaining players expose their hands and the winning player collects the money bet. The outcome is determined by the combinations of cards in the exposed hands. Those combinations are well known as high card, one pair, two pair, three-of-a-kind, straight, flush, full house, four-of-a-kind, and straight flush, and are described in nearly every card game rule book.

Unfortunately, in poker good combinations such as straight flush, four-of-a-kind and full house are

-2-

rare. Most people are reluctant to bet much when they
hold only one or two pair. As a result too many people
drop out of the betting early, which may frustrate even
people with good hands. One common solution is to intro-
duce wild cards to increase the chances of receiving a
good hand and thus keep the game interesting, but even
getting a wild card involves more luck than skill.

        In the children's card game called "fish", a
certain number of cards is dealt to the players. Each
player in turn asks another player for cards of a value
or rank which he holds in his hand. If the other player
does not have any cards of that value, the asking player
draws a card from the remaining deck. Each player tries
to collect all of the cards of a rank to form a group.
The player with the most groups at the end of the game
wins. This children's game offers more strategy than
many children's games and is thus very popular.

        An object of the invention is to provide card
games such as poker with a greater amount of strategy and
skill in order to make them more entertaining.

Disclosure of the Invention

        The above object has been met with a method for
playing a card game in which desired cards are selected
by the players. Each card is marked with machine read-
able indicia so that players may receive cards which
correspond to their selection. The method involves first
reading and storing a deck of such cards. Players select
cards and then cards, corresponding to the cards
selected, are delivered to the players. Selecting and
delivering of cards is repeated until each player has a
predetermined number of cards in his hand. The outcome
of the game is then determined.

        One such game is the card game called "Pickem".
In "Pickem", a deck of 52 playing cards plus 49 or more
"null cards" are used. Null cards are cards having no
value in determining the outcome of a card game. Both
playing and null cards must be identification marked so

that cards may be machine read and stored. Two to eight
players may play. Rules are similar to poker rules.
Unlike poker, however, players receive cards by their own
selection. At each round, each player selects a card and
cards selected or a null card are delivered, depending on
the circumstances. Null cards are special cards that
have no value. There may be a time limit for selecting a
card. Players not completing a selection before time
runs out receive a null card. If more than one player
selects the same card, each of them receives a null card.
If a player selects a card dealt or delivered to someone
in a previous round, then a null card is received. In
lieu of null cards, the game may be played with randomly
chosen cards given instead of null cards.

Card selection games such as "Pickem" are more
entertaining than games relying on luck because strategy
is needed in selecting cards. Better combinations result
in more active rounds. In order to facilitate game
playing, particularly card selection, a card reading,
storing and dealing apparatus is provided.

Brief Description of the Drawings

Fig. 1 is a perspective view of the apparatus
of the present invention.

Fig. 2 is an exploded perspective view of the
apparatus of Fig. 1.

Fig. 3 is a top cutaway view of the apparatus of
Fig. 1.

Fig. 4 is a side cutaway view of the apparatus of
Fig. 1.

Fig. 5 is a side view of the injector mechanism
used in the apparatus of Fig. 1.

Fig. 6 is an exploded detail of the first
roller of the injector of Fig. 5 incorporating a finger
clutch.

Fig. 7 is a top view of the ejector mechanism
used in the apparatus of Fig. 1.

-4-

Fig. 8 is a side view of the ejector.

Fig. 9 is a plan showing the relationship between Figs 9a and 9b.

Fig. 9a is the top half of a flow chart of the operation of the apparatus of the present invention.

Fig. 9b is the bottom half of the flow chart of the operation of the apparatus of the present invention.

Best Mode for Carrying Out the Invention

The card games disclosed herein can best be played with the card reading, storing and dealing apparatus described below. While this apparatus is preferred, it is not the sole apparatus for playing the games.

With reference to Fig. 1, a card game apparatus 10 has a frame 12 seated on a molded base 14. Typical dimensions for apparatus 10 are a diameter of about 18 inches (46 cm) and a height of about 4 inches (10 cm). A carousel cover 18 seated on top of the apparatus 10, and a plurality of hinged output doors 20 close the top and side wall sections of frame 12. They are liftable for access to the working parts in the interior of apparatus 10. Preferably, the frame is made of molded plastic, combining durability and light weight, but other materials may also be used.

A plurality of user stations 28 are distributed around the apparatus. Each user station 28 has an output port where cards are delivered face down. Dealt cards are removed from an output port through a slit 34 under hinged output door 20. A finger notch 32 formed in base 14 and door 20 at each user station 28 permits player access to dealt cards in the output port without having to lift door 20.

The apparatus has selector recesses 42 adapted for receiving selectors 74 indicating a user's card selection. Recesses 42 are typically positioned at each player position 28 in molded base 14 beneath the corresponding output port. Selector dials, slides or buttons

on the selector may be provided to make the card selec-
tion. Once inserted the selector makes contact through a
connector to register the desired selection. Alter-
natively, selectors may communicate card selections to
the apparatus 10 via wired connection or infrared beams.

Typically, the selector displays the selection
through a small window, thus keeping the information
private. A window on the selector displaying public
information for others to see may also be included. Once
the selector is inserted into a recess the private win-
dows are covered while the public windows may be exposed.

With reference to Fig. 2, the interior of ap-
paratus 10 can be seen to comprise an injector 46, a
hopper 22, a carousel 48, an ejector 50 for each output
port 30, and a control board 52. The output ports 30 are
part of frame 12. Injector 46 and ejectors 50 are mount-
ed on supports 54 molded into base 14. Hub pin 56,
projecting from the center of molded base 14, turnably
supports carousel 48 at a hub 58.

A card input hopper 22 mounted in frame 12 can
hold at least 104 cards which are within a specified size
range. Typically, this range includes standard poker and
bridge playing cards. A spring-loaded lever 24 holds the
cards flat against a side wall 26 of the hopper 22. One
or more decks of playing cards are loaded into hopper 22.
The hopper 22 may be top loaded or side loaded. For top
loading, the lever is manually retracted. For side load-
ing, the insertion of the cards may retract the lever.
The cards are then fed one at a time into apparatus 10.

Cards loaded into card hopper 22 are fed by
injector 46 through an opening 64 in back of hopper 22
into carousel 48. Cards are delivered to appropriate
output ports 30 by their corresponding ejectors 50.
Cards ejected from carousel 48 pass through openings 66
in back of the output ports 30 into the output ports 30.
Projection 68 at each output port 30 contacts the top
edge of an incoming card, causing it to rotate and thus
fall flat onto the floor 72 of output port 30. The

-6-

port's rear wall 70 is angled to bring the card to the
front of the port 30 while it falls. Cards are then
removed from output port 30 through slit 34 or by lifting
door 20.

5   Injector 46, carousel 48 and ejectors 50 are
motor driven and powered by batteries 60. Each battery
is situated in an output port 30 behind door 20.
Batteries 60 also provide electric power to control board
52. Typically, four or more D size 1.5 volt batteries
10   provide sufficient power to operate apparatus 10. An
external connector is provided for alternate power
sources.

        Selectors, such as selector 74, are used to
indicate an active user station and to select cards in
15   those card games where the players request specific
cards. Each selector 74, which is about the size of
a stack of 30 cards can be set with dials 76 to one of a
number of settings for the desired communication and
inserted into recess 42 which incorporates a connector.
20   A standard computer interface may also be included via
extra pins in one of the selector recesses 42. Alter-
natively, selector 74 may be set with buttons or slides.
Several user control buttons such as pass, deal, etc. may
be included on selector 74 or at each user station 28.
25   Also, communication between selectors 74 and control
board 52 may be by wires or infrared beams.

        With reference to Figs. 3 and 4, injector 46
loads cards 93 one at a time from card hopper 22 into
slots 82 of carousel 48. Injector 46 preferably has
30   three driven rollers 94, 96 and 98 which are driven by an
injector motor 100 via a worm gear 102. Injector 46,
seen in greater detail in Fig. 5, sits on molded base 14
supported by supports 54. Each roller 94, 96 and 98 is a
small, preferably rubberized, wheel on shafts 112, 114
35   and 116 having gears 106, 108 and 110 respectively.
Gears 106, 108 and 110 each engage worm gear 102 driven
by motor 100. Typically, third gear 110 is about one-
third as small as first and second gears 106 and 108.

-7-

Spring loaded lever 24 holds a deck of cards
firmly against first roller 94. In Fig. 3, first roller
94 turns in a direction such that card 93 is driven
toward carousel 48. The second roller 96 turns in the
5   same direction as first roller 94, but cards contact the
opposite side of second roller 96 from first roller 94,
so all but the first card are pushed back into the hop-
per. Second roller 96 is preferably spaced so that it
firmly contacts the second card to drive it back, but
10   does not contact the first card 93 which continues toward
carousel 48. Third roller 98 drives card 93 into an
empty slot 82 of carousel 48.

The second and third rollers may be spring
loaded against the card or a spring loaded idler wheel
15   such as 99 may be used to insure contact. Alternatively,
a recess may be provided into which the card must be
deflected by the roller in order to pass. Since cards
have some rigidity they act effectively as a spring,
insuring contacte with the rollers.

20. The hopper 22 is tilted upward toward the ca-
rousel at between zero and fifteen degrees. This pre-
vents interference with cards in adjacent slots 82 in
carousel 48. However, the first and third rollers 94 and
98 are mounted with their axes perpendicular to the base
25   14 and so are angled between zero and fifteen degrees
relative to the hopper 22. The second roller 96 is
angled between zero and fifteen degrees relative to the
hopper 22 but in the opposite direction. Thus its axis
is between zero and thirty degrees relative to the base
30   of 14. As the three rollers turn, the cards are thus
driven down to the floor of hopper 22. This keeps the
card loaded against the bottom of hopper 22 and thus in
alignment with scanner 104.

To allow time for carousel 48 to rotate the
35   next empty slot into position before the next card is
inserted, third roller 98 turns faster than first and
second rollers 94 and 96. To prevent binding while both
the first and third rollers 94 and 98 are engaged on card

93, first roller 94 is equipped with a finger clutch,
seen in Fig. 6. First roller 94 has a wheel 122 on a
shaft 112 with a gear 106. Gear 106 and shaft 112 are
not fixed together. A pin 118 goes through the center of

5   gear 106 and shaft 112 and allows roller 94 to turn on
its support 54.

When a card 93 engages only first roller 94,
gear 106 turns causing finger 124 to engage finger 120.
Gear 106 and shaft 112 with wheel 122 then turn in

10   unison, driving card 93 toward carousel 48. When card 93
engages both first and third rollers 94 and 98, card 93
is driven by third roller 98 at increased speed into
carousel 48. Shaft 112 is forced to turn faster than
gear 106 causing the fingers to disengage. Shaft 112

15   then turns independently from gear 106 for nearly one
rotation, accommodating the period of dual engagement.
When the card disengages roller 94, shaft 112 stops until
gear 106 rotates to engage fingers 120 and 124 again.
This introduces an additional delay further separating

20   the cards.

A sensor or scanner 104 is disposed for reading
identification-markings on a card 93 being loaded from
hopper 22 into carousel 48. Scanner 104 is a first
transducer means which is preferably an optical scanner

25   that reads bar codes printed or attached in strips onto
the cards. The injector rollers are generally slightly
tilted relative to the card path so that the roller
drives the card so that it is lined up with the scanner.
The bar code is preferably on the face side of the card.

30   It is parallel to and along both of the longer edges so
that reading is possible in two orientations. Distin-
guishing details of ordinary playing cards may also be
read if enough optical scanners are used. Alternatively,
scanner 104 may be a magnetic or other type of scanner

35   that can sense identification data on the cards. Scanner
104 may also read an instruction card with a bar code or
other type of data containing program parameters for a
specific game. Scanner 104 is in communication with

-9-

control board 52, containing a microprocessor which is
able to keep track of which slots contain cards and which
cards are in which slots.

5   With reference again to Figs. 3 and 4, carousel
48 consists of a flat base plate 78 with many dividers 80
protruding up from carousel base 78 to create slots 82
for individual cards. Typically, the dividers 80 are
about half as high as standard playing cards are wide,
i.e. about 1 1/4 inches (3 cm) high, and protrude into
10   the center of carousel 48 toward hub 58 about one third
of the way. This allows each card maximum freedom in its
slot 82 in order to prevent jamming. Several of the
dividers 80 extend all of the way to hub 58 to keep cards
from sliding around the hub. Hub 58 is free to rotate on
15   hub pin 56, which is mounted to or part of molded base
14.

Carousel 48 is driven by a small motor 84 with
a cogged pulley 85 powered by batteries. A cogged belt
86 wraps around pulley 85 and a pulley 88. Typically,
20   the diameter of pulley 88 is about four to ten times
larger than the diameter of pulley 85. A second pulley
89 is fixed coaxially to and rotates with pulley 88. A
cogged drive belt 90 wraps around second pulley 89 and a
carousel pulley 92 coaxially fixed to carousel base 78.
25   Typically, the diameter of carousel pulley 92 is about
four to ten times larger than the diameter of second
pulley 89. Thus, 16 to 1000 rotations of pulley 85
turns carousel 48 once around. Motor 84 is capable of
turning at over 5000 rpm and is thus capable of turning
30   the carousel at an angular velocity of 5 to 312 rpm,
depending on the relationship of the pulleys.

Motor 84 positions carousel 48 accurately to
within a fraction of a degree. This is typically accom-
plished with a closed loop servo controller, which gener-
35   ally employs an optical encoder wheel attached to pulley
85. Optical emitters and detectors 91 are positioned in
relation to the encoder wheel such that light from the
emitters is interrupted by the rotating wheel and

-10-

detected to provide position feedback. The motor 84 is
preferably driven in a proportional manner using pulse-
width modulation. Polarity and pulse-width modulated
voltage to the motor are commanded by control board 52
5   and derived from current position, desired position,
previous position and external factors, such as varying
moment of inertia due to the presence or absence of
cards. Preferably, the well known method of a digital
proportional-integral-derivative control law is used.
10   Alternatively, other methods of feedback and motor con-
trol may be used to turn and position the carousel so
that cards are injected or ejected in a fast and
efficient manner.

In Figs. 3 and 4, ejectors 50 are positioned
15   around carousel 48, one beside each output port 30. Each
ejector 50 sits on a rocker 136 which is supported on
pivots 130 and 132 above molded base 14. When motor 134
is turned on, the ejector 50 pivots, lifting roller 128
into position between dividers 80 for driving a card from
20   slot 82 into output port 30. The angle of roller 128
against the card is generally selected to make the roller
128 self-energizing, drawing it into firm contact with a
card. Typically, the axis of roller 128 is about 45
degrees from vertical and the ejector 50 is aligned 20
25   degrees off from the radial direction. However, these
angles may vary.

Ejector 50, seen in Figs. 7 and 8 in greater
detail, has an ejector motor 134 seated on a rocker 136.
Rocker 136 is pivotally supported on pivots 130 and 132
30   above molded base 14. A centripetal clutch 140 is con-
nected to motor 134. A pinion 142 protruding through
centripetal clutch 140 meshes with a crown gear 144.
Crown gear 144 is rotatably mounted on its axis to rocker
136. Roller 128 is fixed to the tip of an extension of
35   crown gear 144. Shaft 146 is fixed on the end opposite
roller 128 to the rocker 136.

In operation, when motor 134 is turned on,
centripetal clutch 140 exerts a torque on the ejector

-11-

causing rocker 136 to pivot on pivots 130 and 132. This
brings roller 128 into place against card 138. Pinion
142 turns crown gear 144 which causes roller 128 to turn,
driving the card out of the carousel. When motor 134 is
5   turned off, centripetal clutch 140 disengages and gravity
pulls roller 128 down and away from the slot.

An alternative method for ejecting cards in-
volves the separate actions of first lifting the card and
then driving the card. From below, a lifter mechanism
10   lifts the end of one card up and slightly out of the
carousel. A pair of angled rollers turning above the
slot then grab the edge of the card and eject the card
radially from the carousel. The lifters for all user
stations may be actuated by a common motor. In this case
15   individual motors turn only those rollers at user sta-
tions where an ejection should occur. Or all the rollers
could be driven with a common motor. In this case a
separate motor or solenoid is used at each user station
to lift only those cards to be ejected. The lifting may
20   also be performed by activating a spiral ramp engaging
the lifter. The spiral ramp turns on the shaft of the
motor which drives the roller for that user station.
After ejection the motor is reversed bringing the lifter
back down. Alternatively, a single ejector mechanism of
25   any of the types above may be mounted coaxially with the
carousel. This assembly is then rotated to the user
station where an ejection is needed.

The card game apparatus 10 is controlled by the
control board 52, containing a microprocessor. The
30   microprocessor communicates with sensor 91, scanner 104,
the selectors 74 and the control panel 38 to keep track
of carousel position, the identity of cards in each slot,
card selections, and the like, and commands the various
motors to inject cards, turn the carousel, and eject
cards.
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Control board 52 is also in communication with
sensors for commanding the carousel to perform as a
sensing means. The carousel may be driven by a stepping

-12-

mechanism, a stepper motor or a servo motor. The latter
choice allows the carousel, under control of the micro-
processor, to be used as a sensing means. If a card is
made to interfere with the carousel, the carousel's fail-
ure to rotate is sensed and the microprocessor may then
initiate corrective measures. A protrusion of the carou-
sel can be made to interfere with a lifted ejector and
thus the carousel's initialization position may be infer-
red by the microprocessor. Using the carousel as a
sensing means can also enable the microprocessor to cali-
brate the location of each of the ejectors and the injec-
tor. This sensing means can also be used by the micro-
processor to determine the amount of current needed to
lift the ejectors.

A control panel of buttons and indicators 38
is used to command and communicate a variety of functions
such as 148, 170 and 152. With reference to Fig. 9, when
the power is turned on, indicated by block 148, the game
apparatus is initialized 150, then the user inserts cards
93 into the hopper 22 which are then loaded into carousel
48 by injector 46, as indicated by block 152. The game
or activity is played, as indicated by block 154 and re-
played, as indicated by block 156 one or more times.
Cards are loaded 152 each time the game or activity is
replayed. When play or activity is finished or any time
power-off is requested, as indicated by block 158, the
apparatus goes through a power-off sequence 160.

When the power is turned on 148, the mechanism
is first initialized in three steps, as indicated by
block 150. First, the carousel must be made free to turn.
This will not be the case if a card is partially injected
or ejected. The carousel is commanded to turn forward
one step 162. If this command does not result in the
expected motion 164, then a jam is inferred. In this
case, each of the ejectors and the injector is turned on
briefly in an attempt to clear the jam, as indicated by
block 166. If the jam persists 168, the user is prompted
to fix the problem manually 170. Second, when the carou-

-13-

sel is free to turn, cards are cleared from the carousel.
One or more ejectors are lifted into place, as indicated
by block 172 and the carousel is systematically rotated
slowly forward, as indicated by block 174. This results
5   in the ejection of any cards that may be in the carousel.
Third, an ejector 50 is raised and the carousel turns
backward 176. One of the slots has a protrusion into
which the center of the ejector roller runs causing a jam
to be sensed 178. This establishes the zero position 180.

10   The user inserts cards into the hopper. After
the apparatus is initialized 150, cards are loaded 152.
The deck may also include an instruction card. This
special card has the title and instructions for the game
listed on it. Also specified in bar code or other iden-
15   tification markings, are program instructions for the
control board. If no game selection card is entered, the
apparatus is directed via control panel buttons as indi-
cated by block 182. A user presses a control panel
button, which turns on the injector motor bringing the
20   first card past the sensor. If identification markings
are detected, then the position of each card is stored in
memory 190. Otherwise, the sensor is used only to signal
the passage of card 186. In either case, the cards are
counted and the slots used are registered 190. When one
25   card is injected, the carousel quickly positions itself
for the next card 192. This continues, as indicated by
block 186, until all the cards are removed from the
hopper.

          The game or activity is played, as indicated by
30   block 154, according to the instructions on the instruc-
tion card or via the control panel buttons. To play
again 156, cards used are reentered into the hopper and
reloaded 152 in preparation for the next game or activi-
ty.

35   Whenever power-off is requested, the apparatus
goes into a power-off sequence 160. If any cards are
still in the carousel 194, the carousel is rotated to the
filled slot 196 and the card is ejected 198. This con-

tinues until the carousel is empty. Power is then turned
off as indicated by block 200.

      The apparatus is capable of playing many card
games. In addition to being able to play standard card
5   games, the instruction cards allow the apparatus to be
used with any future game without having an elaborate
user display and keyboard. This also allows the enthu-
siast to design his or her own games redefining the game
operation and function of the control panel buttons by
10   marking blank instruction cards.

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-15-

Claims

1. A method for playing a card game comprising,

         selecting any desired cards of particular identi-
ties in a deck of cards by each of a plurality of
players, whereby each of said players selects the identi-
ty of at least one card,

         delivering a card from an apparatus holding the
deck, said cards having identification markings thereon,
said apparatus capable of reading said markings and deli-
vering the cards to each of said players, some of said
cards being null cards having no value in determining an
outcome of a card game, said selecting step and said card
delivering step defining a round, any player selecting an
identical card to a card selected by another player in
the same round receiving one of said null cards, any
player selecting a card delivered to a player in any
previous round receiving one of said null cards, and any
other players receiving cards selected by said players,

         repeating said selection step and said card
delivering step until a predetermined number of cards is
delivered to each player, each repetition of said selec-
tion step and said card delivering step defining a dif-
ferent round, and

         determining the outcome of said card game.

2. The method of claim 1 wherein said selecting step has
a time limit, any player failing to select a card within
said time limit receiving one of said a null cards.

3. The method of claim 1 wherein said delivering of a
card is carried out by a card game apparatus which stores
cards at locations therein and which delivers cards to
each of said players, said apparatus capable of reading
said machine readable indicia on said cards and remem-
bering the locations of said cards stored therein.

-16-

4. The method of claim 3 wherein said selecting of cards
is accomplished by each player selecting a card by
electrically signalling to said card game apparatus.

5. A method for playing a card game comprising,
        (a) electronically reading and mechanically
storing a deck of cards identification-marked with mach-
ine readable indicia,
        (b) reading said cards by machine and
delivering some of said cards from the deck to a
plurality of players,
        (c) selecting any specific desired cards by
each player,
        (d) delivering a card from the deck to each of
said players, the identities of said delivered cards
corresponding to cards selected in step (c), steps (c)
and (d) defining a round,
        (e) repeating steps (c) and (d) until a
determined number of cards is delivered to each player,
each repitition of steps (c) and (d) defining a different
round, and
        (f) determining an outcome of the card game.

6. The method of claim 5 wherein some of said cards are
null cards having no value in determining said outcome.

7. The method of claim 6 wherein any player selecting an
identical card to a card selected by another player in
the same round is delivered one of said null cards, any
player selecting a card delivered to a player in any
previous round is delivered one of said null cards and
any other players are delivered cards selected by them.

8. The method of claim 7 wherein said selecting step has
a time limit, any player failing to select a card within
said time limit receiving one of said null cards.

9. The method of claim 5 wherein any player selecting an identical card to a card selected by another player in the same round receiving a randomly chosen card, any player selecting a card delivered to a player in any previous round receiving a randomly chosen card, and any other players receiving cards selected by them.

10.   The method of claim 5 wherein the outcome of said game is determined by rules of poker.
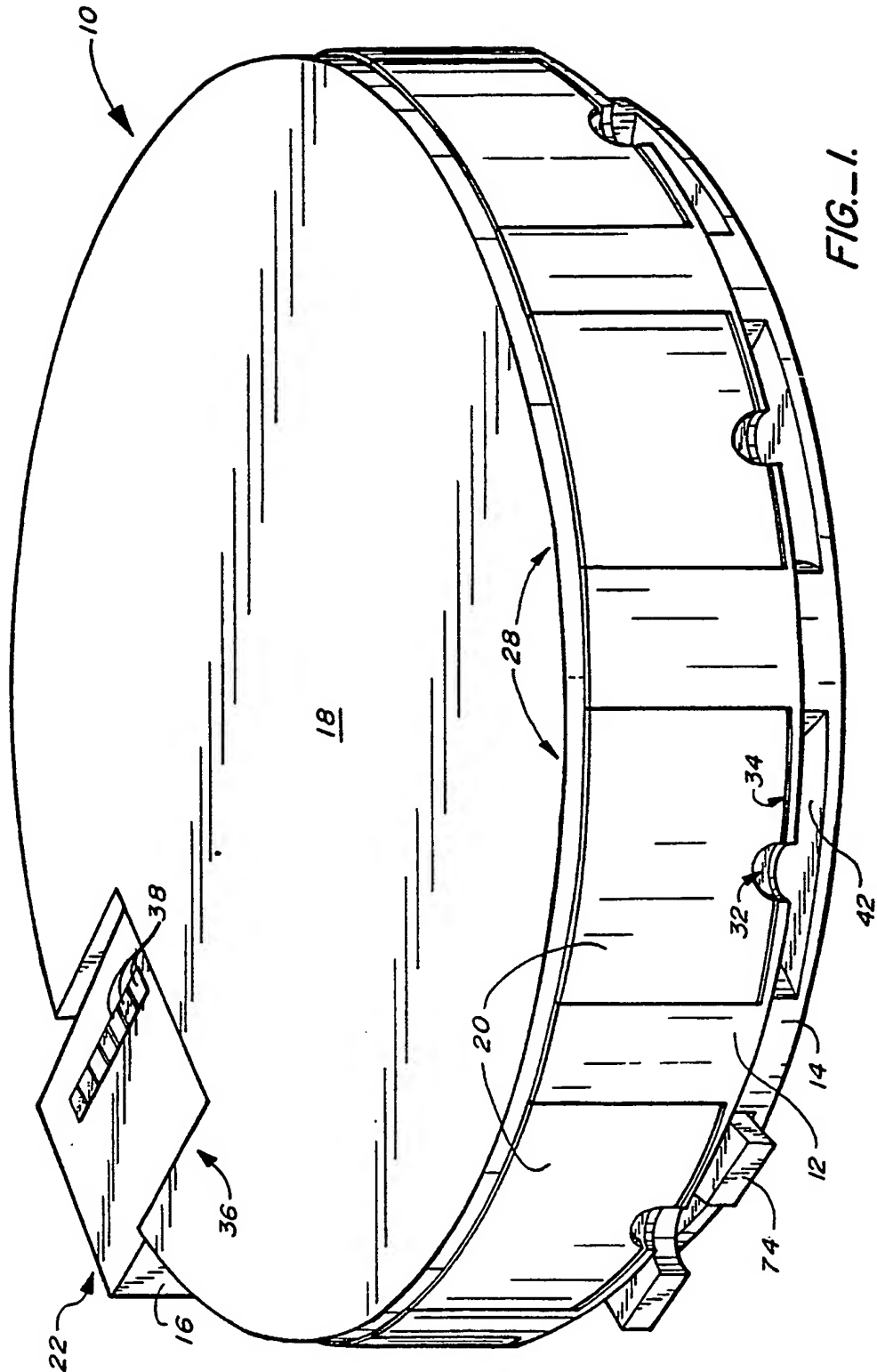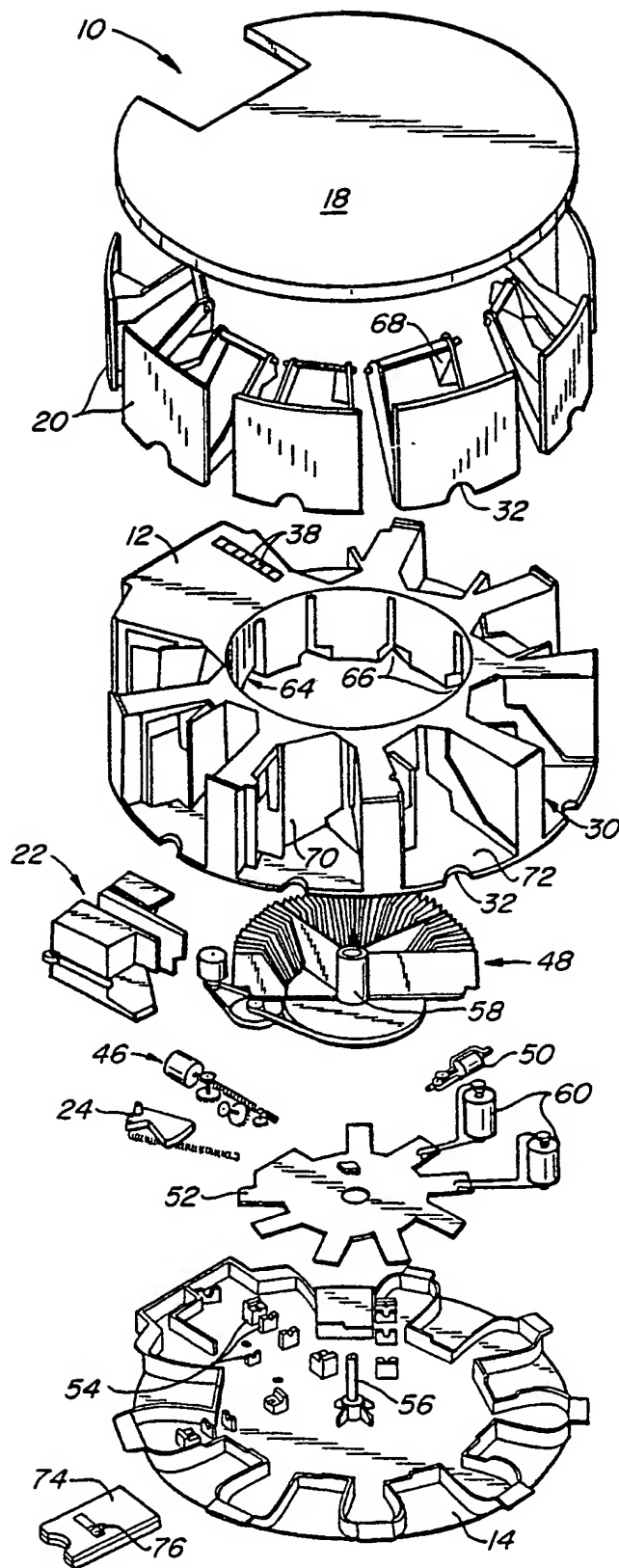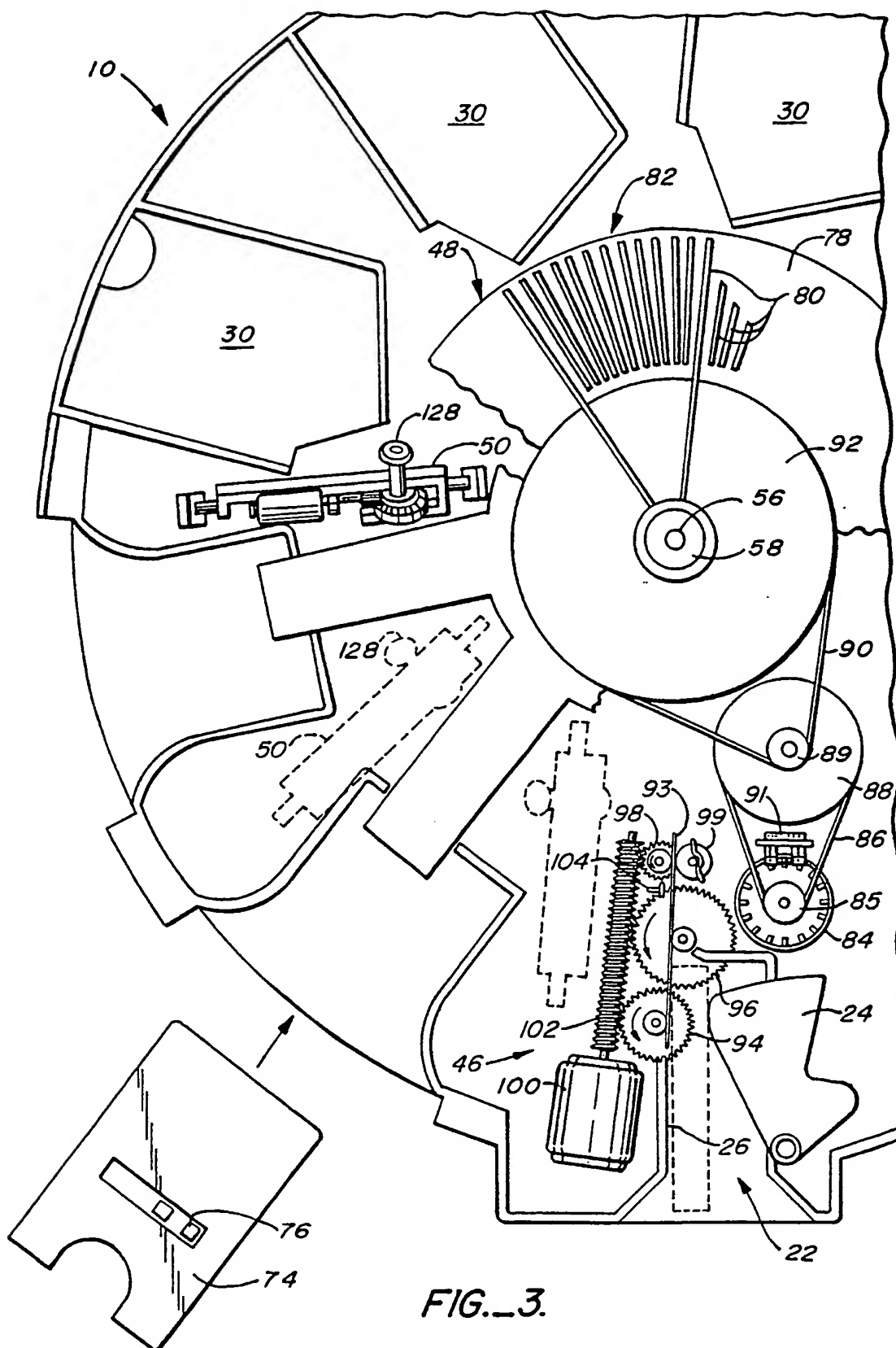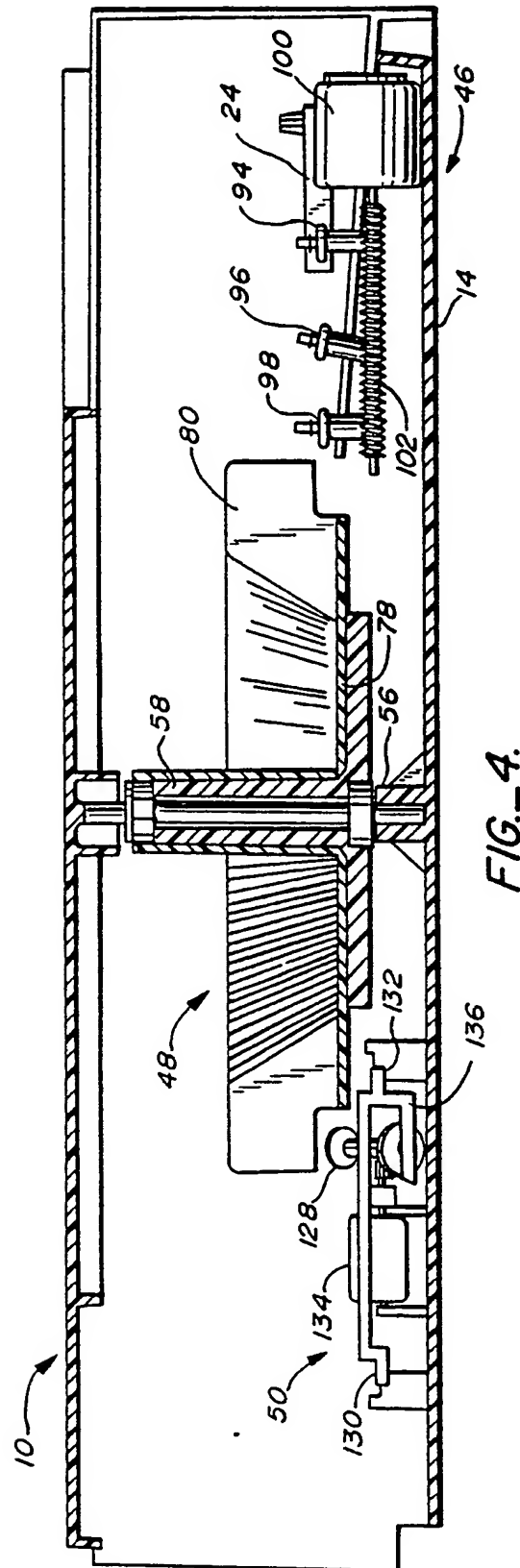
FIG._1.

FIG._2.

FIG._3.

FIG._4.

FIG._5.

FIG._6.

FIG._7.

FIG._8.

POWER-ON REQUEST — 148

┌─ 150

CAROUSEL FORWARD ONE STEP — 162

ATTEMPT TO CLEAR JAM — 166

DID CAROUSEL MOVE ? — 164   NO

JAMMED BEFORE ? — 168   NO

YES

ASK USER TO CLEAR — 170

YES

LIFT EJECTOR WHEEL — 172

TURN CAROUSEL FORWARD CLEARING ALL CARDS — 174

TURN BACKWARDS — 176

JAM SENSED ? — 178   NO

YES

COMPUTE ZERO POSITION — 180

FIG._9A.

FIG._9B.

FIG._9.

FIG._9A.
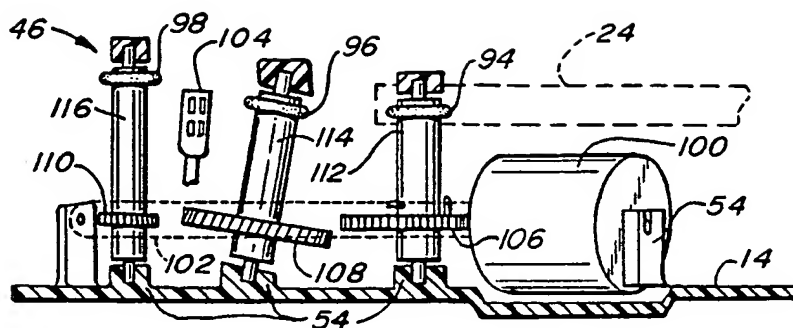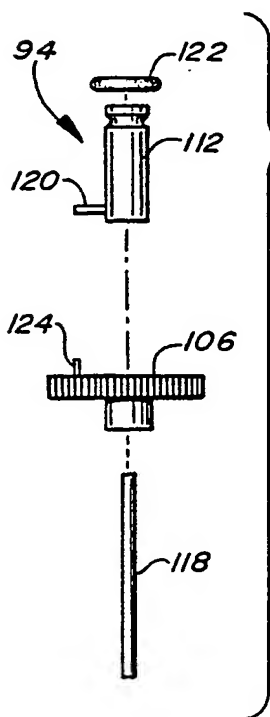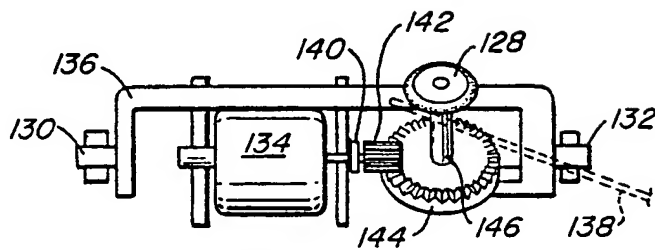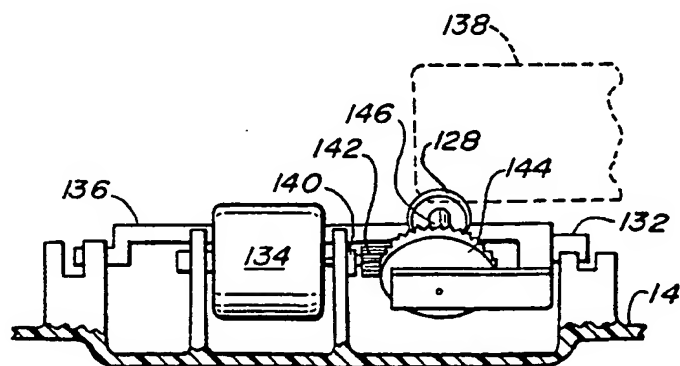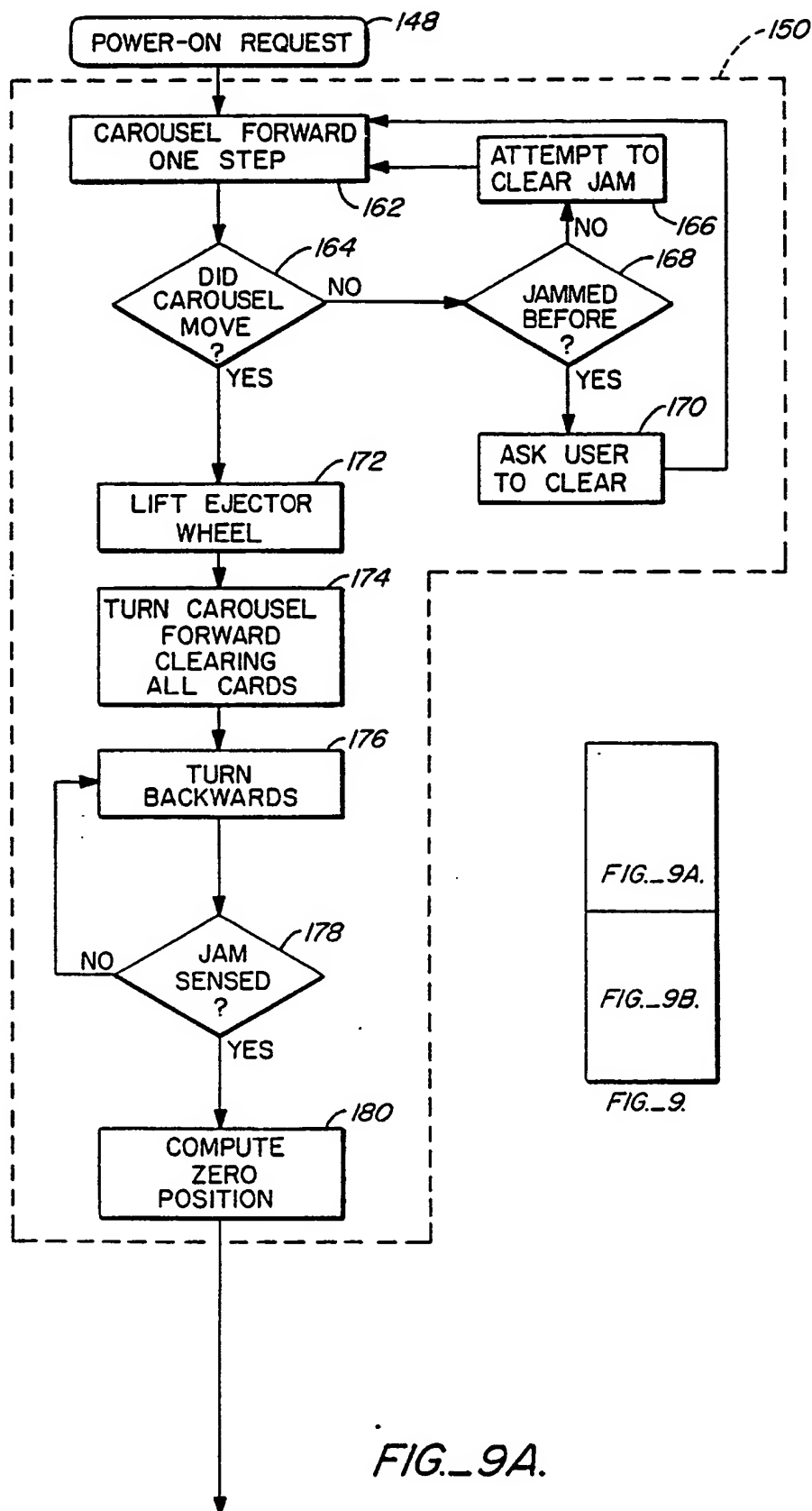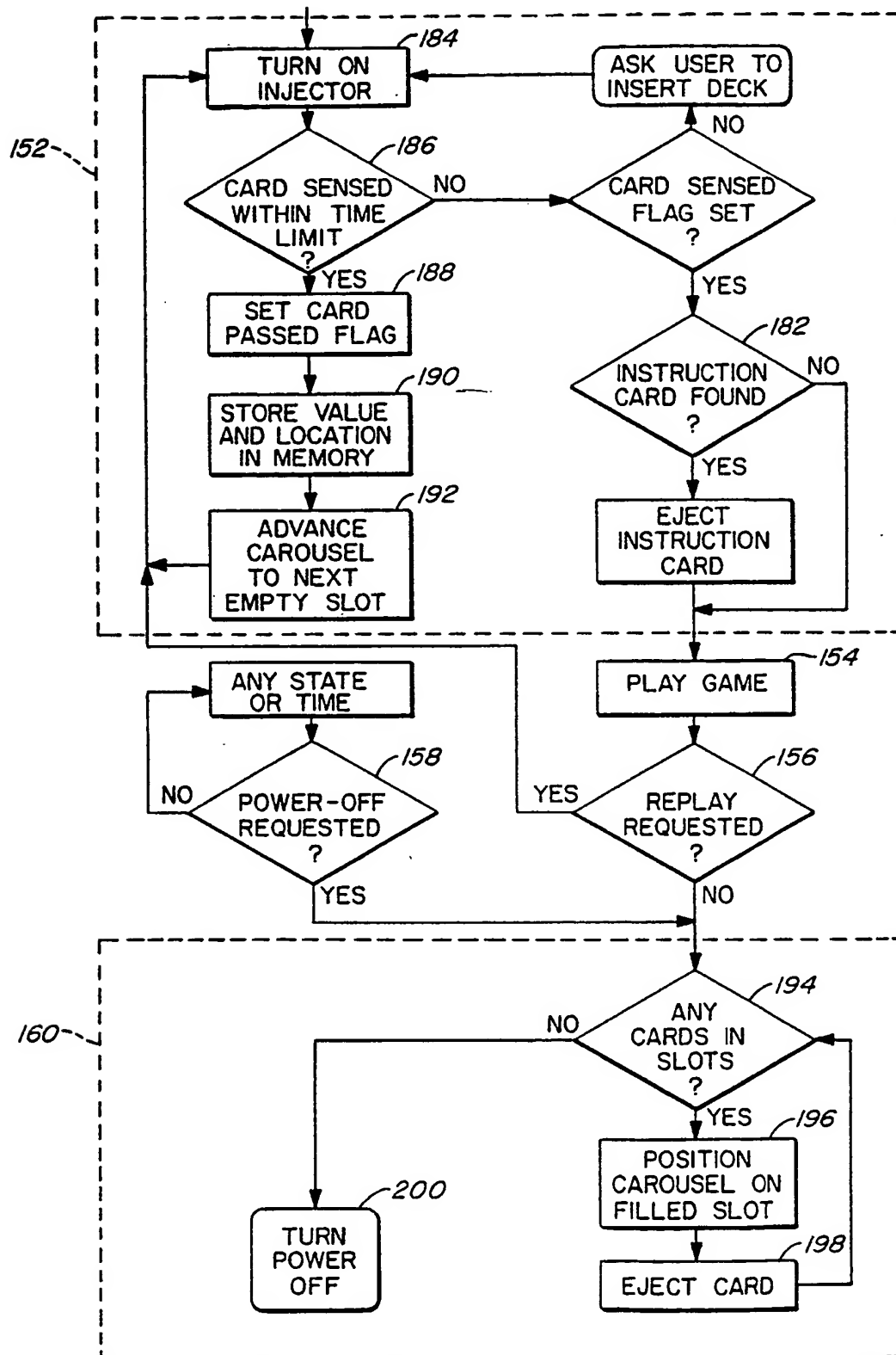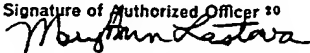
FIG._9B.

INTERNATIONAL SEARCH REPORT

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) 3

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC (4): A63F 01/14
U.S. Cl. 273/149P

II. FIELDS SEARCHED

Minimum Documentation Searched 4

Classification System	Classification Symbols
U.S.	273/149R, 149P, 138A, 85CP

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched 6

III. DOCUMENTS CONSIDERED TO BE RELEVANT 14

Category *	Citation of Document, 16 with indication, where appropriate, of the relevant passages 17	Relevant to Claim No. 18
Y,P	US, A, 4,534,562 (CUFF et al.) 13 August 1985 see the entire document.	1-10
Y	US, A, 4,380,334 (MINKOFF et al.) 19 April 1983 see the entire document.	1-10
Y	US, A, 3,770,269 (ELDER) 06 November 1973 see column 3, lines 33-38 and lines 42-46.	2,8

* Special categories of cited documents: 15

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search 2	Date of Mailing of this International Search Report 2
04 September 1986	0 1 OCT 1986
International Searching Authority 1	Signature of Authorized Officer 20
ISA/US	MarvAnn Lastova

Form PCT/ISA/210 (second sheet) (May 1986)